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16 July 1954

MEMORANDUM FOR: THE RECORD

SUBJECT : Project Monitor at [REDACTED]

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1. Time and Place of Meeting: 7 through 9 July 1954 at the [REDACTED]

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50X12. Attendance: [REDACTED]

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4. Discussion:

a. A Revere T-500 tape recorder has been modified with the Portable Tape Recorder Amplifier and is ready for demonstration in Washington. The recorder has been equipped with a low impedance record head. Details of this device are covered in the June Progress report which is due in Washington 15 July.

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c. Construction of the Time Signal Radio has been delayed by the fact that the switch originally designed for the receiver was not approved by [REDACTED] and thus redesign of this elaborate "ON-OFF" switch will be necessary. It was expected that the 5 WWV receivers would have been completed by the 9th of July. It is now anticipated that these radio receivers will be demonstrated and delivered on 19 July. These receivers will be tested and approved by [REDACTED] prior to being carried to Washington. As requested by the undersigned, [REDACTED] has prepared a proposal of the development of a 5-10-15 mc receiver. This proposal will be submitted to the C/TSS/APD/EEB for its consideration.

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DOCUMENT NO. _____

NO CHANGE IN CLASS. ☐☐ DECLASSIFIED

CLASS. CHANGED TO: TS S © 2011

NEXT REVIEW DATE: _____

AUTH: [REDACTED]

DATE 11/11/01 REVIEWER: 037169

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d. Nothing further has been done on the Microphone Preamplifier inasmuch as the prototypes made by [] were delivered to TSS/APD for testing. It is planned that these items will be taken to the Bureau of Standards for testing as soon as arrangements can be made with the Bureau of Standards.

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e. Work on the Transistorized Sound-D-Tech Kit (P-89) is progressing very satisfactorily and it is anticipated that 10 kits will be completed and delivered before the end of August. Specifications for this kit have been almost completely written and they will be reviewed and checked again after the kit is completed. [] is awaiting delivery of parts (components) for the AM-FM tuner and telephone induction coil. Five of the associated 90 db amplifiers will be "potted" and the remaining five will be left "unpotted". Comparative tests (presumably at the Bureau of Standards) will be run then to determine the relative merits of "potting" transistorized amplifiers of this type. The following recommendations for improving the broad band AM-FM tuner were made by the undersigned at this time.

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- 1) Shape of the case should be thinner for easier handling.
- 2) Calibrate the dial in such a manner that ranges and approximate frequencies are shown for each setting of the tuner.
- 3) Lower microphonic level in tubes used.
- 4) Addition of a panel ground connection.
- 5) Use of a larger and more easily procurable battery. Bigger size will lessen frequency of battery replacement.
- 6) Remove audio oscillation ("howl") on low frequency range.
- 7) Improve sensitivity on high frequency ranges where possible.
- 8) Make a careful check of FM sensitivity using slope detection.
- 9) Improve design of case to make batteries more accessible.

f. The old proposal for the Transistorized Radio Operated Radio Switch was returned to [] for reconsideration on 20 May 1954. A new proposal has been submitted to APD and will be submitted to the C/TSS/APD/ERB for his comments and suggestions. Two approaches to the problem are therein submitted. [] will be the [] project engineer for this project.

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g. Microphone Studies are dormant at the present time pending approval or modification of the transistorized microphone preamplifier.

h. The first patentable item under consideration by [] will be the Piezo-electric transistor. It is believed that a device can be constructed which will behave in the manner of a piezo-electric crystal microphone but with a low impedance output. The amount of amplification of audio signal and the

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amount of inherent noise in such a device are, at present, problematical. Discussions between the C/TSS/APD/EKB, the C/TSS/ASD/EB, and the undersigned indicate that such a low impedance device will have many applications in the field of audio surveillance. It is hoped that work on this problem will be done by [] who is joining [] from Transistor Products Corporation. It is planned that he will work part-time with the Solid State Research group in the [] plant of [] but will spend a majority of his time with the Transistor Research group in []

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j. A complete report on the Surface Barrier Transistor will be ready for TSS/APD on 1 August 1954. This project is under the direction of the Transistor Research group; []

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k. The problem of a transistorized Pocket Transmitter is being investigated. The major part of the investigation at this time is the problem of high frequency transistor oscillators for use in a high frequency transmitter. No deadline has been set for this feasibility study.

l. [] is writing a work outline for the 100 mw (input) Transmitter for use with the Devenco rf power source. At present, it seems feasible to construct a transmitter similar to the 490 KC transmitter discussed in para. i. above if there is an urgent need for this transmitter. If the problem is not urgent, it is felt that longer ranges can be achieved by using the 15 to 50 mc frequency range. [] who was taken to N.Y.C. to become acquainted with this project, has been removed from the problem indefinitely!

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m. It has been agreed between [] and [] that the research and development sections of the [] plant should be formalized. At the present time, [] tells me that the research group will consist of the following people:

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He has informed me that no technicians for the research group have been hired because he is assuming that the construction pressure from TSS/APD

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will drop soon. There is some question as to whether or not [] will be able to continue at [] because of his unfulfilled Selective Service obligation. [] hopes to hire [] during the next few months.

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At present, [] sees three major problems before the research group. First, the group should complete the study and evaluation of surface barrier transistors; this should take three man-months. Secondly, he feels they should design high impedance audio amplifiers; this should take two man-months. Lastly, the development of a piezo-electric transistor; this should take six man-months.

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Future problems which [] hopes to consider are:

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- 1) Continuing study of new transistors such as Silicon (presently available); three man-months per year.
- 2) Study of transistors as mixers: two man-months.
- 3) Use of photo-transistors as switching devices to turn off and on relays; three man-months per year.
- 4) Use of Solid State devices as energy conversion units; six man-months per 2 year period.
- 5) Design of I.F. strip using Collins mechanical filters and broad band RC coupled untuned amplifiers; three man-months.
- 6) Study and evaluation of presently available power transistors; one man-month.
- 7) Study and design of A.G.C. circuits; one man-month.
- 8) Evaluation and use of ferrite material in the design of miniature coils.
- 9) Study of the increase in articulation (intelligence) of binaural over monaural pick-up; one man-month.
- 10) Study of transistor detectors as compared to diode Solid State detectors; one man-month.
- 11) Binaural pick-up by time shaving of single channel; one man-month.
- 12) Methods of modulating transistors both FM and AM; two man-months.

5. Actions:

a. TSS/APD

- 1) Inquire about returning one copy of the security form submitted by []

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2) Obtain a list of persons in the process of being cleared for B-A.

3) Obtain for loan one Bass-3 kit AM tuner.

4) Obtain for loan one instruction sheet accompanying the Bass-3 kit.

5) Check with C/TSS/APD concerning the possibility of having persons working on CIA contracts deferred from military service.

6) Transmit forms for clearance to [] and [] was to do this, but found he could not transmit these documents without arousing suspicion.

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7) Investigate the status of [] report on his visit to the []

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8) Transmit test results of microphone preamplifier to [] when available.

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9) Transmit our comments and suggestions to [] on the 5-10-15 mc receiver project.

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10) Transmit our comments and suggestions to [] on the Radio Operated Relay project.

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b. []

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1) Deliver FM tuner proposal.

2) Pot five 90 db amplifiers. Deliver 10 each 90 db amplifiers.

3) Return BTL reports No. 26388A, B, C, and Commo evaluation of the receivers.

4) Deliver finalized specifications on

(a) Sound-D-Tech Kit: P-89

(b) 490 KC Transmitter

(c) Radio Adaptor and receiver for 490 KC

(d) Oscillator at 4.0 mc

(e) Receiver at 4.9 mc

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5) Deliver five WWV Time Signal Radios.

6) Build a prototype model of proposed 74 mc wall transmitter.

7) Complete and deliver prototype of P-89 kit.

8) Complete and deliver prototype of oscillator and receiver.

9) Complete and deliver 490 KC transmitter and accompanying radio adaptor and receiver with reports on all items.

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- 10) Return three each 80 db amplifiers submitted for repairs.
- 11) Continue to submit new transistor test data studies.
- 12) Complete and deliver one portable record amplifier mounted on a conventional tape recorder.
- 13) Deliver pocket transmitter feasibility study.
- 14) Complete study phase of transmitter project with Devenco.

[Redacted]

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Distribution:

P - 89:1

P - 77(via [Redacted])

Chrono:1

HB:2

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